



57 PLANK AVENUE  
PAOLI, PA 19301  
PHONE: 610-651-0800  
FAX: 610-651-4943

September 7, 2004

**INVESTIGATIVE FINDINGS  
MAC NEIL RESIDENCE  
FIRE LOSS 1/21/03**

Sure Guard was retained to assist in the investigation surrounding the fire loss at the MacNeil residence, 148 Gansett Road, Woods Hole, MA 82543, occurring on January 21, 2003.

To assist in my investigation I have reviewed deposition testimony of:

Ken Elliot  
Phyllis MacNeil  
Patrick Poire  
Glen Rogers  
John Vose

I have reviewed and analyzed documents consisting of, but not limited to:

Alarm components  
Alarm control panel specifications and programming  
BOCA Building Codes  
Central station alarm activity reports  
Contracts and correspondence  
Documents produced by Intercity Alarms in Discovery  
Drawings and sketches  
Estimates and job orders – Intercity Alarms  
Proposal dated 6/23/83  
Installation order 6/21/83  
Alarm component list dated 7/11 – no year  
Job work order dated 11/7/95  
Job work order dated 8/17/00  
Job work order dated 11/17/00  
Job work order dated 6/23/01

Fire investigation reports of Falmouth Fire Department  
Interrogatories to Intercity Alarms and Answers  
Invoices for work performed by Intercity Alarms  
Manufacturers information regarding various alarm components and  
control panels  
Massachusetts Building and Life Safety Codes  
Newspaper reports of the fire  
NFPA documents, NFPA 72 standards and requirements  
Numerous photographs  
Programming documents for equipment  
Specifications  
    FBI control panel 1272  
    FBI communications module 115  
    Programming instructions for FBI model 115  
    FBI XL-2 control panel/communicator  
    Ademco 1026 alarm processing center  
    Seaboard RF wireless transmitter  
    AES (IntelliNet) wireless transmitter/receiver  
Standards and recommendations  
    Commonwealth of Massachusetts  
    780 CMR, 901.0 General,  
    917 Fire Protective Signaling Systems 919 (entire)  
    527 CMR, Board of Fire Prevention Regulations  
    BOCA National Building Code  
    BOCA National Fire Prevention Code  
    NFPA standards  
Underwriters Laboratories information

Utilizing the above information, I have formed the following opinions and findings concerning the design, installation, service, maintenance, testing, monitoring and operation of the automatic fire detection system and its signaling and annunciation capabilities at the time of this fire loss on January 21, 2003.

## **I BACKGROUND INFORMATION**

148 Gansett Road is a two-story brick structure originally built in about 1955, with two later additions, with a full basement and attic, consisting of approximately 3500 square feet on the first floor. The house contained three

bedrooms on the first floor and four bedrooms on the second floor, with an attic space separating each end of the house and dividing the second floor with two bedrooms located on each end of the house. The house is located approximately 500 feet from the road on a bluff above Gansett Road.

## **II HISTORY OF EVENTS**

On January 21, 2003, the day of the fire, John Vose and several workmen were in the process of renovating and refinishing kitchen cabinets and woodwork. The weather was particularly cold that day (about 9 degrees Fahrenheit and winds of 20 to 30 miles per hour). At about 5 to 5:15 PM, work was completed for the day and the house was closed and locked by Mr. Vose. At approximately 11:45 PM, Mr. John Vose, the caretaker, received a telephone call at his home, from Intercity Alarm Company, Inc., advising him that they had received a low temperature alarm from the MacNeil residence. Mr. Vose, who had been sleeping, immediately got up, got dressed and responded to the MacNeil house. Upon approaching the house, Mr. Vose realized there was a fire in progress, which he was able to observe through a large picture window located near the kitchen table. He attempted to enter the house in anticipation of using the telephone to call the fire department. However, the smoke and heat was too great. Following this, he returned home and contacted the 911 system resulting in a fire department dispatch, with the first firemen arriving at 12:07 AM.

The question as to why a low temperature signal would be sent to the central station during an actual fire condition, as well as the lack of a fire alarm signal being transmitted, will be addressed later in this report. However, one thing is abundantly clear at this point, that the automatic fire detection system allegedly protecting this residence never activated or transmitted an automatic fire alarm signal to the central station prior to or during this entire fire event.

## **III BUILDING'S AUTOMATIC BURGLARY AND FIRE DETECTION SYSTEM**

On or about June 1983, Intercity Alarm Co., Inc., located at 22 White's Path, South Yarmouth, MA 02664, hereafter referred to as Intercity Alarms, was

contacted by the MacNeils and submitted a proposal to upgrade the existing automatic alarm system as follows.

Proposal dated 6/23/83 -

- install a new 1272 combination control panel (fire and burglary)
- 2 keypads
- 2 motion detectors
- 4 smoke detectors
- 4 fire heat detectors
- 2 8" inside fire bells
- 4 building low temperature sensors - 2 on the first floor and 2 on the second floor

Subsequently the automatic fire and burglar alarm system was upgraded as outlined by Intercity Alarms in their proposal. This upgraded system was designed to provide complete and automatic fire protection and transmit all alarm signals to an off site central monitoring station via the phone lines and in the event of a phone line loss or fault, via a radio wireless system similar to cellular phone service.

From the time Intercity Alarms installed this upgraded system, documents and Mrs. MacNeil's deposition testimony confirmed they were the only alarm company providing service, testing, monitoring and inspections of the burglar and fire alarm system.

A. By way of explanation, the newly installed fire detectors function as follows. The four heat detectors are what is referred to as a "rate of rise detector" and respond to and activate during a fire condition in the following manner. If the room temperature rises at a rate in excess of 15 degrees over a one minute time span, the detector will activate a fire alarm. Or, in the event of a slow fire growth, the "rate of rise detector" will activate when the room temperature reaches 135 degrees.

Smoke detectors activate regardless of temperature, upon sensing a pre-determined amount of smoke within their sensing chamber as determined by Underwriters Laboratories specifications. In essence, any visible smoke discernible by a human being, and entering the smoke detector chamber, is sufficient to activate a fire alarm.

Low temperature (loss of heat) detection operates as follows. The residence had four low temperature sensors, which are preset to activate the same as a thermostat when the temperature reaches that setting. Example, if the low

temperature sensor is set for 45 degrees, once the temperature within the building falls to 44 degrees, an activation will occur, and a signal will be transmitted to the central station. Clearly, a low temperature sensor will not activate during an increase in temperature such as a fire occurring within its area of detection, except under the following scenarios. A low temperature sensor is normally wired as an open circuit device, thereby requiring the closing of a contact on the sensor to activate an alarm condition. It has been recognized that fire attacking wiring to either a fire detector or a low temperature detector will cause a short circuit, thus activating the low temperature warning from a high heat or fire attack of the wiring, such as occurred in this case. Clearly, fire detection devices such as heat detectors or smoke detectors, are designed to activate long before a fire can grow in intensity and attack any wiring concealed in the ceilings or walls.

**B.** By way of explanation, the communications from the fire alarm control system is designed to function as follows. The control panel contains a digital communicator connected to the phone lines, which in the event of a fire detection by the system, is activated and transmits coded digital signals to the central station, which in turn interprets these digital codes and contacts the fire department, police department, or responsible party that is designated to be called.

In the event of a loss of phone lines, the wireless radio system, which also was connected to the alarm control panel, is designed to transmit similar signals via a cellular network to the central station. This wireless system was designated as an AES Intellinet (AES Corporation) would be used as a backup to insure that critical burglar, fire alarm, or other signals were received by both means at the central station. However, the four low temperature sensors were not connected to the wireless system and only transmitted signals to the central station over the existing telephone lines.

**C.** In describing a central station, this is an entity that is set up to monitor alarm signals from various customers and companies and relay the information to the appropriate authorities. The central station is configured with multiple receivers, telephone lines, radio receivers, and operators manning this facility 7 days a week on a 24 hour basis. Central station operators' sole responsibilities are to act upon and dispatch authorities on alarm events. Central station operators have no direct connection to installation, service or maintenance of a customer's alarm system.

#### **IV OVERVIEW OF THE ALARM INSTALLATION AND SERVICE FROM 1983 THROUGH JANUARY 21, 2003**

##### **Chronological service of the MacNeil system by Intercity Alarms:**

7/11/83      Installed system with FBI 1272 alarm panel, burglar and fire protection

11/7/95      Replaced Seaboard with AES backup wireless radio  
(NOTE – a Seaboard radio is a different type of wireless backup similar to the AES system, only using slightly different technology)

9/21/98      System not resetting. Repaired and tested all signals.

8/17/00      System trouble. Replaced batteries and tested all signals.

11/17/00      Replaced side door contact.

6/28/01      Replaced back door contact.

It is quite clear from reviewing Intercity Alarms' records as well as deposition testimony from Mr. Ken Elliot, Vice President of Intercity Alarms, that their record keeping does not depict how, why or when an additional FBI control panel #XL-2 was installed in the MacNeil residence. However, documents produced by Intercity Alarms depict the XL-2 control panel as being present in the MacNeil residence as early as November 10, 1995. Mr. Elliot indicated that the model #115 digital communicator board, which would have been used with the original installation of the 1272 panel in 1983 to communicate alarm signals was notorious for its failures and he speculates that the XL-2 control panel/communicator was installed to replace the troublesome communicator board 115 at some time after 1990 and prior to August 17, 2000.

Intercity Alarms' work order dated 8/17/00, indicates that three batteries were replaced, one in a 1026, one in an XL-2 dialer, and one in the radio. In referencing the first panel as a 1026, this would apply to a Model number manufactured by another company by the name of Ademco, which Mr. Elliot indicated was minimally used by Intercity Alarms. It appears that the Ademco alarm panel was pre-existing equipment in the MacNeil home prior to 1983. However, one point is very clear. Intercity Alarms does not know what equipment was actually installed or how it operated in the MacNeil residence prior to this fire. Secondly, if in fact the 115 communicator that was used in conjunction with the 1272 panel failed, and was replaced by an XL-2 control panel communicator, at that point, the

entire system wiring attached to the 1272 panel and in all probability the Ademco 1026 for both burglary and fire protection, should have been transferred to the XL-2 panel and all other equipment removed.

Attempting to do unsupervised cross wiring between different control panels primarily serving the same functions would result in unreliable and totally unsupervised intersystem connections and reporting, and is in violation of NFPA standards and BOCA National Fire Prevention Code (F-501.4.1).

For purposes of this report, please reference Exhibit A for applicable codes and standards.

By way of explanation, the XL-2 combination panel provides more supervision, more zones, and superior communications reliability than the old 1272 with its added on 115 communicator. It is questionable at best, as to how the antiquated Ademco 1026 was being utilized in this installation.

As of August 17, 2000, Intercity Alarms documents clearly indicate the presence and use of a pre-1983 critical piece of alarm control equipment (1026) that was alleged to have been replaced pertinent to Intercity Alarms upgrade proposal of 6/23/83. Continued use of and reliance on this existing control panel was clearly improper.

#### A. "Tested all signals:"

Intercity Alarms' technicians, during their service of the MacNeil system on 9/21/98 and 8/17/00, clearly indicate and attest to the fact that all codes were tested to the central station and "worked okay". However, in reviewing past central station activity reports for those time periods, not one signal was received pertaining to fire codes or fire alarm equipment. In fact, only one manual wireless radio push button test was received from the radio system on 8/17/00, and is contrary to the written document statement by the technician, which states "**tested all equipment codes and all work okay**". Mr. Elliot further explains in his deposition testimony that the technicians would not take the time to actually physically and properly activate the smoke detectors throughout the residence in order to test the signals and function to the central station. He further states the technicians are limited in time that they can spend at the particular premise and they have to move on to other calls. Additionally, Mr. Elliot stated the signal testing would have been performed at the dialer. In essence, a jumper would be placed across the terminals to test each type of signal to the central station. Once again, it must be noted if in fact this did occur as alleged, the

communicator or dialer was never programmed to transmit a fire signal, as fire signals were never received at the central station during these alleged testing episodes or for that matter, at any other time.

Intercity Alarms had an absolute duty and responsibility to advise the MacNeils that it was necessary to perform required complete testing of the fire protection system to insure reliable, reasonable and expected operation. Intercity Alarms failed to communicate or offer the basic and expected fire system testing to the MacNeils as industry standards require, especially when it was company policy to ignore the fire components when performing service on the combination fire and burglary alarm system.

## **V SUMMARY**

A. During the deposition testimony of John Vose, the issue has arisen as to whether Mr. Vose's actions on January 21, 2003 of removing the cartridge fuses to a sub panel in the basement in order to trace electrical circuits would have affected the fire detection system. Mr. Vose stated emphatically that he replaced the cartridge fuses after testing in order to restore power and lighting to the basement as required for other workmen to continue working that day. Evidence does not exist that AC power was ever lost to the fire control system, and to the contrary, it would not have mattered, as the system was totally backed up by DC batteries contained within the control equipment (these batteries were allegedly replaced and new on August 17, 2000). Secondly, power must have been present for the control panel to operate and send the low temperature alarm as it did on January 21, 2003.

B. In an effort to clarify the signaling (low temperature) transmitted to the central station on January 21, 2003, the XL-2 panel (fire and burglary control panel) was allegedly programmed to transmit the following signals: fire alarm, burglar alarm, low battery, heat monitor. By comparison, the AES backup radio system is only generic and was allegedly programmed to send the following information: radio test signal, burglary, unit failed to check in, fire alarm, and manual push button test. This AES radio was not connected or configured to transmit a low temperature alarm. Therefore, when the central station received the low temperature alarm, it was in fact being transmitted over the telephone lines by the XL-2 control communicator only.

C. The fact that a low temperature alarm was sent during a fire condition would indicate the activation of a low temperature sensor (one of four) was caused by fire attack to the device's wiring and not by an actual low temperature condition.

D. Installation of three new batteries on August 17, 2000 clearly indicates the system was capable of stand alone operation without AC power. However, evidence does not exist indicating that AC power was ever lost at the time of this fire and therefore this is irrelevant.

E. Receipt of the low temperature alarm via the phone lines indicate that the control panel and its signaling path had not been compromised in any fashion at that point by fire attack. Although Intercity Alarms indicated in one of their flyers sent to their customers how critically important it was that the alarm control panel dials or radios their central station receivers to notify them of a problem, they totally failed to connect the low temperature warning to the existing radio system at the MacNeil residence and only connected it to the XL-2 communicator.

F. Although Mr. Elliot acknowledges in his deposition and interrogatories that Intercity Alarms follows industry standards and NFPA codes, Intercity Alarms violated numerous sections of state requirements and NFPA codes during their installation, service, maintenance, testing and inspection of the MacNeil system as follows.

Massachusetts State Building Codes,  
1990 BOCA National Fire Prevention Code  
1993 BOCA National Building code  
1980 NFPA 74 Installation, Maintenance and Use of Household Fire  
Warning Equipment  
1989 NFPA 74 Household Fire Warning Equipment  
1982 NFPA 72C Remote Station Protective Signaling  
1996 NFPA 72 National Fire Alarm Code

G. Throughout numerous visits to the MacNeil's residence from 1983 through 2001, Intercity Alarms failed to properly test or verify receipt of any fire related signals to demonstrate and insure that the automatic fire protection system was operational, connected and reporting all codes properly to the central station.

In order for Sure Guard to render findings, opinions and conclusions, it is necessary to rely on industry standards, Commonwealth of Massachusetts and local laws, as well as regulations and good industry practices. Part and parcel of this reliance would be consideration of well established standards of the National Fire Protection Association, which has established a National Fire Alarm Code. This particular code is referenced throughout the Commonwealth of Massachusetts Fire Protection Codes, Fire Prevention Codes and Life Safety Regulations as a requirement to be followed. This organization (NFPA) was founded in 1894 for the purpose of consolidating and publishing industry safety standards and hazards. Throughout the years this organization has published and updated reference standards following extensive studies and tests of devices and systems to determine the relationship of hazards to life and property. As a result of the ongoing tests and evaluation of materials, devices, products, equipment, construction methods and systems affecting such hazards, NFPA has become a recognized standard of application throughout the United States and is referenced in all major building and life safety codes.

Sure Guard relies on Underwriters Laboratories, Inc., standards for safety pertaining to equipment manufacturer, maintenance, inspection, testing and service. These standards and requirements have developed through the years of testing to insure the expected proper operation of fire alarm equipment.

Sure Guard also relies on manufacturer's recommendations and installation requirements pertaining to their own products so as to insure safe and proper function of this equipment during an emergency condition.

The methodology used by Sure Guard is widely accepted by reputable experts in the alarm industry. Scientific principles, tests and studies have been professionally evaluated and validated over the years by applying peer reviewed NFPA standards and requirements.

Sure Guard relies on NFPA standards as a **minimum accepted industry guide** for proper fire and life safety systems, including protection of life and buildings such as the one at issue. These standards and experience in the industry pertaining to application, service, maintenance, testing and installation as well as standards and factual documents surrounding this issue were used as a methodology to arrive at our conclusions and findings.

The use of the above mentioned life safety standards has been subjected constantly to peer review throughout the years of their existence. These

standards have been constantly improved and updated by various protection engineers throughout industry to insure sound and reliable theory.

Deputy Fire Chief Glen Rogers of the Falmouth Fire Department testified that the Commonwealth of Massachusetts has requirements for fire protection and placement of smoke detectors, which has been referenced earlier in this report.

## V1 CONCLUSIONS

I conclude with a reasonable degree of professional certainty that the fire occurring on January 21, 2003 went undetected and unreported for an extended length of time as a result of failure to follow standards and codes and the total disregard for safety by Intercity Alarms, in the design, maintenance, service, lack of testing, and monitoring of the fire detection system located within the MacNeil residence, 148 Gansett Road, Woods Hole, MA.

- A. Intercity Alarms negligently failed during their upgrade of the existing burglar alarm system in 1983 to properly connect and test the newly installed fire protection system. This failure is evidenced by a total lack of the required acceptance testing and documentation forms.
- B. Although the smoke detectors were installed in 1983, Intercity Alarms never recommended cleaning and testing the MacNeil's smoke detectors as good and proper industry standards require.
- C. Intercity Alarms totally failed to document, test or identify when critically important control communications equipment was added and programmed to the system.
- D. Intercity Alarms improperly added a new control/communicator panel (**the heart of the system**) without removing the old, outdated and malfunctioning equipment, in violation of NFPA and good industry standards.
- E. Intercity Alarms chose to cross-wire questionable and unsupervised parts of the control system and communications, in

violation of NFPA and good industry standards and practices, thus making proper performance questionable at best and assured failure likely.

F. Intercity Alarms never properly tested or attempted to test any of the burglar and fire alarm system to the central station during their service visit of 8/17/00, and in fact, misstated and improperly stated on the work order "**tested all equipment codes – all works okay**". Intercity Alarms also indicated on their work order of November 17, 2000, "**tested signals to central station**".

G. Mr. Elliot, Vice-President of Intercity Alarms, during his deposition testimony stated it was not their policy to test any system to the central station.  
NOTE – This is in violation of good industry standards as well as NFPA 72, 7-1.6.2, (Reacceptance testing) and 7-1.6.2.2 and is most certainly unacceptable as an industry standard.

H. Mr. Elliot also acknowledges the recommendation by NFPA to replace smoke detectors after ten years, which Intercity Alarms acknowledged as being required although the MacNeil smoke detectors were approximately 17 years old and had **never been tested**. In fact, although NFPA specifically recommends complete testing of the system every three years as a bare minimum, Intercity Alarms never advised the MacNeils about or recommended this crucially critical service.

I. Although Intercity Alarms purported on 11/17/00 to have "**tested signals to central station**", as explained by Mr. Elliot this type of testing would entail tripping all circuits at the communicator and never physically activating individual smoke detectors as required. The central station never received any type of fire detector signaling, thus clearly indicating an improperly programmed and connected fire communications and control system, and clearly a fire system that did not activate or communicate and was in fact inherently dangerous.

In reviewing all currently available information, I conclude improper cross-wiring of old controls, improper programming and circuit supervision, as

well as a total disregard of the most basic and common industry requirements for system testing, caused this fire alarm system failure. Even as the residence burnt to the ground, the fire alarm system totally failed to respond in any fashion, either by sounding local bells or by transmitting any type of fire alarm signals to the central station.

Had the heat and smoke detectors been properly wired, connected and supervised as required, this fire would have been quickly detected in its incipient stage and prompt early notice given to the fire department. This early notice would have resulted in the fire being contained to the kitchen stove area at worst and in all likelihood early smoke detection prior to actual fire and flames and provided ample time for the fire department to respond. Had the control communicator been properly tested as alleged on 8/17/00 and 11/17/00 by Intercity Alarms, the glaring defects of this automatic fire detection system would have been quite apparent and afforded sufficient time for proper correction of these deficiencies, thus avoiding a totally destructive fire such as occurred on January 21, 2003.

Sure Guard reserves the right to amend these findings as required should additional facts and information become available.

SURE GUARD, INC.

  
Richard N. Fedor